

UB Department of Industrial and Systems Engineering (ISE)

BS in Industrial Engineering (IE)

Facts About IE@UB

Full-time faculty: 11
Average class size: 25
Average starting salary:
\$58,581 (BS)
IE lecture courses
taught by teaching
assistants: 0

Degrees offered:
BS, MS, MEng, PhD
A five-year BS IE + MEng in Production Management
A five-year BS IE + MBA degree

Industrial Engineers Keep Thriving in the Changing Economy

For over 100 years, industrial engineers have been the leader of changes in the industry, helping reduce cost, improve product quality and enhance operational efficiency. Now that the service industries have steadily increased their shares of the economy, industrial engineers are again leading the changes by providing engineering support to strategic, tactical and operational issues to not only the manufacturing industry, but a wide range of service industries, such as healthcare, transportation, banking, as well as education.

IEs are challenged to save industries and businesses money and increase efficiency by eliminating waste of time, money, materials, energy, and other commodities. This is why many industrial engineers are promoted to management positions.

As an IE, you may use your knowledge to:

- design the computer interface for a military system;
- decide how hazardous waste should be routed to keep communities safe;
- site warehouse facilities to allow efficient distribution of groceries;
- simulate the flow of patients through an emergency room to improve treatment processes;
- or insure that pacemaker batteries meet quality standards.

Industrial Engineers: Doing Things Better

The need for industrial engineers is growing because industrial engineers are trained specifically to engineer processes and systems that improve quality and productivity. IEs design a wide variety of systems that combine people, technology, information, materials, transportation, and energy to make goods or services. IEs solve problems in health care, aviation, defense, retail, transportation, entertainment, and finance, and in industries that manufacture everything from breakfast cereal to aircraft engines.

Events

Engineering Impact on Society Project; Engineering Club Showcase; Welcome Back Engineering BBQ; Student Association Food and Clothing Drive; E-Week Activities, including Buffalo Science Museum; UB's Relay for Life; IIE Regional Conference.

Curriculum Overview

Freshman-Sophomore

Freshman and sophomores take courses in science, mathematics, and engineering science, and required general education courses. The solid basis in problem solving and analytical thinking is essential for IE students. The curriculum is similar to other engineering majors, allowing flexibility when selecting the IE major. In the Spring semester, an optional one-credit course, IE 101, Discover IE, offers an overview of the IE profession.

Junior

Juniors take courses in core IE topics to learn tools for modeling, improving, and designing systems – from computer interfaces, to hospital facilities, to transportation networks. Specific topics include probability and statistics, linear algebra, human factors and ergonomics, production planning, facilities design, and operations research.

Senior

Additional courses cover core IE topics, such as computer simulation and quality control. Students may take technical electives in advanced IE topics such as computer-integrated manufacturing, human-computer interaction, six sigma quality or lean manufacturing. Two technical electives may be chosen in other engineering, math, or science departments, or in related areas such as economics, psychology, or business. All IE seniors complete a lab course integrating and applying IE methods to design problems, and complete a faculty supervised internship at a local company where they gain real-world experience in IE practice.



Dean Stenger and Professor Bisantz with UB Industrial Engineering graduates.

Did You Know?

All UB IE students do a faculty-supervised IE internship at a local company during their senior year.

The U.S. Department of Labor's Bureau of Labor Statistics has great news for those who want to pursue industrial engineering careers. In spite of the declining manufacturing industry in the U.S., industrial engineering employment is expected to grow 20% over the next 8–10 years, almost double the rate of the average for engineering professions and other occupations.

Careers for UB IE Grads

Opportunities for industrial engineers exist in Western New York, nationally, and internationally. Our degree-holders work in a number of industry and government settings including: American Airlines, American Express, Boeing Aerospace, Chase Manhattan Bank, GM Powertrain, the Government of Mexico, IBM, Microsoft, Motorola, NASA-Langley, Praxair, Sandia National Labs, Sun Microsystems, the US State Department, and United Parcel Service International.



IE students working together.

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IE Students Are Involved

IE students at UB participate in a number of professional and student organizations, reflecting the wide range of student interests. Activities include academic competitions, conferences, field trips, sponsored speakers. Here are just some.

- National honors societies: Alpha Pi Mu, (IE); Omega Rho (operations research); Tau Beta Pi (engineering).
- UB student chapters and student memberships available in American Society of Quality (ASQ); Human Factors Society (HFS); Institute of Industrial Engineers (IIE); Institute of Operations Research and the Management Sciences (INFORMS); Society of Manufacturing Engineers (SME); The Society of Women Engineers (SWE).

"Being an active member of IIE has furthered my educational experience here at UB because of the great professional networking opportunities that are available. Aside from those, the social and service activities give us a great chance to get to know other IEs that might not be in your classes as well as to benefit the school in many ways." **Dave Myers**, IE student

Research Opportunities

Undergraduates in ISE have the opportunity to work with faculty on funded projects in research centers such as the Center for MultiSource Information Fusion and through independent study projects.

Work Opportunities for Students

Internship and co-op programs expose you to real employment situations. Employers look for people with a proven track record, so real-world work experience is one of the best ways to prepare for becoming a practicing engineer. This will enhance prospective job opportunities at graduation. Students may gain valuable skills and industrial experience through UB Engineering's student employment programs. Engineering Career Institute is a one-credit course that prepares students with job search skills and an understanding of many critical workplace topics when entering the work environment. Through the Co-op Program students work for a semester in industry and earn two credits per co-op period. All IE students take IE496 Industrial Internship, a semester-long, three-credit course exposing students to company projects.

Recently, students have gained experience with these local and national companies, including: Delphi (Lockport, NY); Lockheed Martin (Owego, NY); Paychex (Rochester, NY); Pepsico (Chicago, IL), Praxair (Tonawanda, NY).

Did You Know?

UB's ISE department ranked 23rd in the country, in *US News and World Reports'* survey of top national engineering schools.

Many students with BS IE degrees go on to pursue graduate studies in IE areas of production management, human factors, production systems, and operations research, or to pursue MBA degrees. Students have also gone on to receive advanced degrees in business, economics, information science, law, and other engineering fields.

IE graduates have a flexible degree that supports a number of different careers. In addition to large corporations an IE graduate may work at a consulting firm where IE skills are applied across a range of industries. Many IEs move into management positions because they have a broad perspective on system design and improvement – in fact, many company CEOs have an IE background. IEs are even moving into politics where they can "re-engineer" government processes and services!



Student Excellence Margaret Devendorf

Margaret completed her UB BSIE and has continued at UB as an IE graduate student, where she is interested in the design of reconfigurable systems. As an undergraduate, Margaret was a varsity athlete (Women's Crew) and a top IE student.

Margaret's summer IE work experience included a position as a manufacturing engineer for a company who produces flight and power generation controls.



Successful Alumni Jessyca L. Gajewski (BS IE '97)

Continuous Improvement and Materials Manager, Greatbatch, Inc., Medical Power Division

Gajewski is a manufacturing professional with over 10 years experience in Lean Manufacturing implementation, Six Sigma methodology, capacity planning, facility design, material system management, and project leadership. She is certified in Lean Manufacturing is an ASQ Six Sigma Black Belt. She has also worked with Moog INC. and GE Transportation Systems.



Award-Winning Faculty

ISE Professor Mark Karwan, Praxair Professor in Operations Research, accepts the Dean's Award for Achievement.

Former dean **Mark H. Karwan**, the Praxair Professor in Operations Research, has served UB's ISE department for over 30 years. His broad expertise in mathematical programming focuses on modeling and algorithmic development, with applications in logistics, production planning under real time pricing, capacitated lot-sizing, hazardous waste routing and security, and military path planning. His multiple teaching awards include the (SUNY) Chancellor's Award for Excellence in Teaching and the Tau Beta Pi Professor of the Year.

To apply, please visit admissions.buffalo.edu.

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